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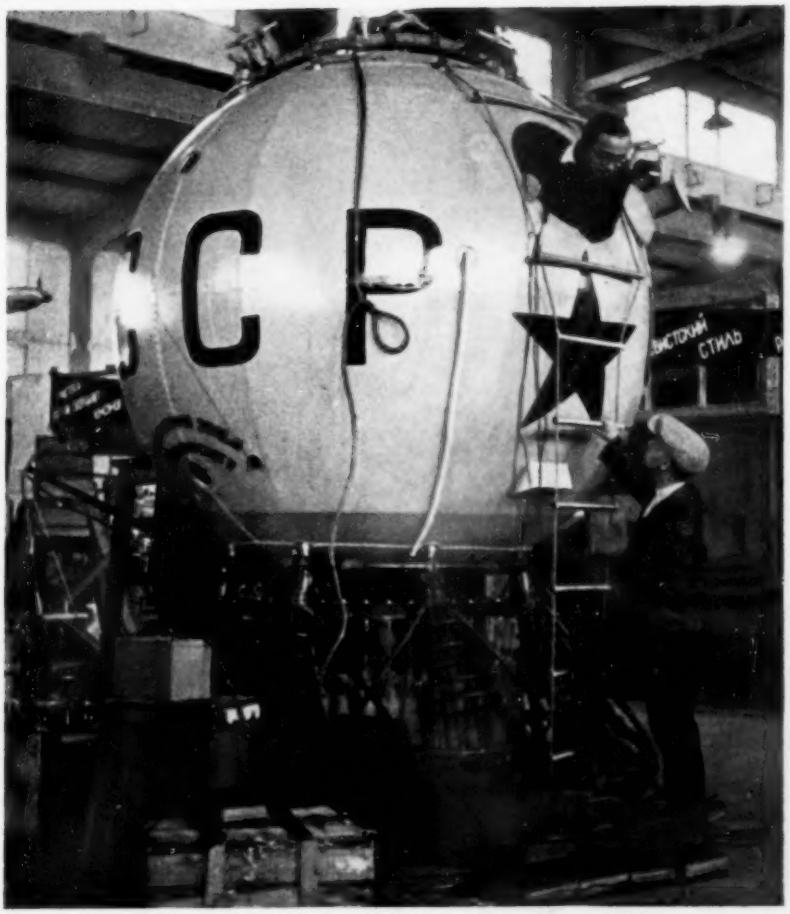
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



OCTOBER 14, 1933

Three-Passenger Stratosphere Gondola

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A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXIV No. 653

The Weekly Summary of Current Science

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DO YOU KNOW?

The earth gets about 44,000 thunderstorms a day.

Forty years ago there were just four automobiles in the United States.

There are about five to six million red blood cells in the body of a grown man.

The silkworm industry is carried on in more than 2,000,000 Japanese farm houses.

When the funeral custom of mummifying a body was at its height in Egypt, the process required more than two months.

The young of a grizzly bear at birth may weigh less than a pound although the mother tips the scales at 500 to 1,000 times that much.

Newfoundland has capitalized on its wild growth of blueberries since 1927 by shipping almost a million dollar's worth to the United States.

Some new German refrigerators use dry ice as the cooling agent.

Jerusalem's population has increased 44 per cent. in about ten years.

The word electricity was coined by Queen Elizabeth's physician, William Gilbert.

The sargassum fish has a mouth so large that it can gobble up a crab or fish almost its own size.

Art of the cave man, found on a number of cave walls in France and Spain, is extremely rare in England.

A family should spend from one-fifth to one-third of its food allowance money for milk and milk products, says the Bureau of Home Economics.

A huge block of lapis lazuli two feet long, a foot wide, and eight inches thick is one of the rare exhibits at the Field Museum; it was obtained from the grave of an Inca of Peru.

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These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.

BACTERIOLOGY

"Phage" Found to Cure With Antitoxin, Not by "Eating"

Famous Bacteria-Dissolving Power Secondary, Apparently Not Important to Conquering Disease, Report Declares

BACTERIOPHAGE, popularly known as the "germ eater," cures disease not by "eating" or dissolving the causative bacteria but by producing antitoxins in the body. The famous bacteria-dissolving power is merely a side-issue, apparently of no importance in curing or preventing disease, as has long been suspected by some investigators.

This explanation of how the potent but mysterious phage acts to cure or to prevent disease was given by Dr. N. W. Larkum of the Michigan Department of Health at the Indianapolis meeting of the American Public Health Association. Dr. Larkum reported studies supporting this theory.

Hopes Not Entirely Fulfilled

When Dr. F. d'Herelle, formerly of the Pasteur Institute and Yale University, announced his discovery of bacteriophage, it gave rise to great hopes that here at last was a way to wipe out disease. All that would be necessary to stop an epidemic of cholera, for instance, would be to pour a tube of the proper bacteriophage into the drinking water supply. These hopes were not entirely fulfilled, but results were sufficiently good to encourage a number of physicians in continuing to use the phage and to investigate its mode of action. Among them has been Dr. Larkum.

If it is true, as he now strongly suspects, that all bacteriophages are capable of producing antitoxins, scientists now have the means to fight specifically most if not all known diseases caused by bacteria. This may be done from the preventive standpoint, by immunizing well persons with bacteriophage; or sick persons may be treated by injecting serums prepared by immunizing animals with bacteriophage.

Poisons Are Real Causes

Dr. Larkum pointed out that in most if not all infectious diseases, the serious illness is caused not by the bacteria themselves but by the toxins or poisons they produce in the body. Bacterial or infectious diseases have only been successfully treated when soluble toxins could be obtained from the causal organisms and antitoxins developed.

For example, success in the treatment of diphtheria followed the development of diphtheria antitoxin. Prevention of this disease now is possible by injecting substances known as toxin-antitoxin or toxoid. These stimulate the body to produce enough antitoxin on its own to neutralize the poison from any diphtheria germs that invade it.

Typhoid Patients Not Sick

The effect of bacteriophage when used to treat disease suggested that this was also the way it acted. When typhoid bacteriophage was injected into typhoid fever patients, it was particularly noticed that the symptoms of poisoning subsided. The bacteria did not disappear any sooner than usual, but the patients were not sick.

Earlier investigators, among them Dr. d'Herelle, considered this possibility but their studies led them to believe that bacteriophage did not produce antitoxin. Dr. Larkum and his associate, Ruth Corpron, however, conducted experiments with exactly opposite results. Their work showed that bacteriophage is not a toxin, is not itself an antitoxin, but produces or stimulates the production of antitoxin in the body.

BEAUTY FROM THE DESERT

Centuries, perhaps millenia, since the cacti have boasted of "progress" in the perfection of their flowers; yet the big blossoms of this huge relative of the common night-blooming cereus were miracle enough to attract the fascinated attention of many visitors at the Chicago exposition, Century of Progress

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ARCHAEOLOGY

String of Beads 37 Feet Long Dug Up in Indian Home

A CLUMP of tiny beads which placed end to end make a bead string over 37 feet long is the prize discovery of archaeologists who have been excavating Indian ruins near Allentown, Arizona. The longest string of Indian beads previously found in the Southwest measured 32 feet.

The beads are of red and white shell, said Dr. Frank H. H. Roberts, Jr., who directed the excavations for the Laboratory of Anthropology at Santa Fe, and who has just returned to his post at the Bureau of American Ethnology, Washington. So small are the hand-made beads that 20 would be required to the inch. Sifting out the thousands of tiny specks from the earth required more than two days of labor.

Dr. Roberts suggests that the beads and some fragments of turquoise with them lay, perhaps, in the pouch of an important medicine man of the village. If so, the pouch and the sinew string that held the beads in place have long since disintegrated.

Assisted by students from the laboratory, Dr. Roberts excavated the village ruins, finding new evidence of the evolution of architecture in prehistoric Indian settlements.

When Southwestern Indians first made homes, they dug pit houses for themselves and roofed them with poles and brush. Around the houses were storage bins for winter food supplies. Dr. Roberts finds that the storage bins in time were enlarged into dwellings and there were even row houses in the old settlements. The underground pit house became the village kiva, or church. Down to today, Pueblo kivas where ceremonies are held are still built underground.

The evidence shows that these architectural changes took place in about 200 years for the different type structures are there and charred pieces of timber from the ruins tell the dates, in terms of tree rings, when the buildings were in use. The dates cover a period from 700 A.D. to 950 A.D.

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PUBLIC HEALTH

Scientists Took First Chance With Encephalitis

BEFORE trying to give encephalitis or "sleeping sickness" to convicts by the bite of presumably infected mosquitoes, officers of the U. S. Public Health Service tried to experiment on themselves, as is the custom among medical scientists.

Dr. J. P. Leake, in charge of the federal health service's encephalitis investigations at St. Louis, Dr. L. L. Williams, Jr., and Dr. Bruce Mayne all took their chance of getting this serious disease by letting mosquitoes feed on patients and then on themselves. None of them has contracted the disease as a result. This may be because, in the course of their work with the patients, they have already acquired immunity.

The next step was to repeat the experiment with ten convicts, volunteers from the Mississippi Penitentiary, who will win their freedom if they survive the experiment.

In calling on Mississippi authorities for convict volunteers, the federal health authorities followed a precedent set in 1916 when a similar experiment with Mississippi convicts Dr. Joseph Goldberger of the U. S. Public Service was able to prove that pellagra is due to deficient diet and that it can be corrected.

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METEOROLOGY

Microclimatology, Science That Studies "Working" Weather

Temperature, Evaporation Rates and Other Environmental Factors Measured Close to People, Animals and Plants

WEATHER Bureau records are notoriously inadequate pictures of conditions which human beings, cats and dogs, cabbages and cornstalks are up against. Official thermometers are always perched well above ground, in structures that provide a maximum of shade and ventilation, and a considerable degree of shelter from direct wind, snow and rain. Hence, no matter how ideal their readings are from the viewpoint of pure atmospheric physics, they are of much less human interest than are those of the humbler unofficial instruments that share our common lot down in the sweltering street, or out on the blizzard-stung prairie.

Great Difference in Short Distance

Some scientists, especially ecologists, who study the intimate details of the social life of plants and animals in nature, have taken cognizance of this, and are using a kind of meteorology of their own. They read the weather factors where these are actually operative on living things; at the level of the grasses in the field, among the leaves of trees and bushes in the forest, and where man and his suffering fellow-creatures must breathe and sweat in the streets and crowded inside spaces of great cities.

This new and closely applied climate study has been given the name "microclimatology" by one of its pioneers, a German scholar. It is the climatology of little spaces.

Significant differences in this extremely localized weather can be found in amazingly short distances. One European student of the subject found greater differences in temperature between ground level and six feet above it, among the trees of a forest, than was shown on official records of "general" temperatures between cities on the coast and hundreds of miles inland.

Microclimatology takes account, also, of factors other than temperature, such as relative humidity, air movement, and their close companion, evaporation rate. Differences in these will be as marked as they are in temperature, over distances as little. Instrumental determinations of the evaporation rate from free water surfaces show three or four times as great evaporation in midsummer sun as in the shade a few feet distant. Determinations of wind velocity in a sheltered pocket behind trees or a wall show contrasts as striking, when compared with the record as obtained above the trees or roof-tops.

Of course, everyone who has ever kept a tree between himself and the sun in summer, or a wall between the wind and himself in winter, has been a kind of rule-of-thumb microclimatologist. But the active students of the new science want exact and quantitative data rather than loose and qualitative guesses. They want such information not only because it is more scientific but because it is more practical. For on the study of microclimatology, both indoors and out, will depend a great deal of the success in human comfort as well as the cost in cash, of the great new branch of engineering which is just arising—the practice of air-conditioning.

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ENTOMOLOGY

1933 Bad Grasshopper Year, Entomologists Report

GRASSHOPPER depredations in the United States during the past summer were the worst for many years, Dr. W. H. Larrimer of the Bureau of Entomology, U. S. Department of Agriculture, reports. Although the early hatching from their eggs in the soil was slowed down by wet, cold spring weather, subsequent heat and drought operated to the advantage of the 'hoppers, the damage they caused in late summer more than made up for their delayed start. Even into early October they were reported as still going strong in the northern Plains States. (*Turn Page*)

Egg-laying for 1933 was finished in August, Dr. Larrimer stated, and preliminary cursory examinations give every indication that 1934 will again be an exceedingly bad grasshopper year, unless unpredictable climatic factors come to the rescue of the farmers. The Bureau's annual detailed grasshopper-egg survey is now in progress, and will be completed some time in November. It will then be possible to make a better estimate of damage to be expected next summer.

The one bright spot on the whole depressing grasshopper map, Dr. Larrimer said, is Minnesota. Here an active and informed state government has been cooperating with the farmers and local authorities in an intense eradication campaign for the past two or three seasons, with the result that in Minnesota the grasshopper damage last summer was negligible, while the insect hordes played havoc in states farther west and southwest.

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AERONAUTICS

Soviet Ascension Breaks World Altitude Record

See Front Cover

ENCLOSED within the metal shell pictured on the front cover of SCIENCE NEWS LETTER, three Soviet scientists rose higher above the surface of the earth than man has ever been before, in an ascension from Moscow on September 30. It is the gondola of the Soviet free balloon USSR. Only twice before has man using similar means reached comparable heights, and the leader of both flights was Prof. Auguste Piccard.

The Soviet balloon, larger than those of previous ascensions and carrying three men, Ernest Birnbaum, George Prokofiev and Konstantin Gudenoff, is reported to have reached an unofficial altitude of 62,340 feet, compared with the official record of 53,153 feet set by Prof. Piccard in August of 1932. On both of Prof. Piccard's ascensions only two men were taken up.

Instruments bringing data on cosmic rays, physical and chemical composition of air at high altitude and its electrical conductivity, pressure, temperature and humidity are said to have landed safely with the balloon. The craft was built by military engineers and has a gas bag 36 meters in diameter with a volume of 25,000 cubic meters.

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CHEMISTRY-BIOLOGY

New Heavy Water Kills Tadpoles and Guppy Fish

Large Output, Thimbleful Every Two Days, Enables Princeton Scientists to Use the Water Freely

HEAVY WATER, containing the recently discovered double weight hydrogen, kills tadpoles, guppy fish and worms.

Prof. W. W. Swingle of Princeton, using some of the rare heavy water manufactured by Princeton chemists, found that the extraordinary H two O, with 92 per cent. of its hydrogen atoms consisting of the isotope mass two (deuterium), is lethal to certain fresh water animals.

Green frog tadpoles survived only an hour when placed in the heavy water. Tadpoles of the same sort immersed in distilled water that contained only 30 per cent. heavy water, lived happily and unaffected for 24 hours. Paramecia, one-celled organisms that are favorite biology experimental material, resisted the heavy water successfully for 24 hours.

Relatively large quantities of heavy water are now being produced in Princeton's Frick Chemical Laboratory by Prof. Hugh S. Taylor, Prof. Henry Eyring and Arthur A. Frost, chemistry fellow. A cubic centimeter, approximately a thimbleful, of the heavy water is produced every two days. This unusual supply of heavy water is allowing Princeton scientists to use it in various untried experiments.

Prof. Earle E. Caley has demonstrated that it has a smaller capacity for the dissolving of salts than ordinary water. Tests are now being made to ascertain its effect upon acids.

Physicists studying the structure of the atom will find the heavy water of great use, because most of its hydrogen atoms are twice the ordinary hydrogen mass. Experiments have shown that in attempts to break down the atom by collision with electrically propelled hydrogen projectiles, much smaller voltages are required when heavy water is used.

Prof. Taylor explained that there is one part of heavy water in every 5,000 parts of ordinary Princeton rain-water. Twelve hundred gallons of ordinary water are treated in order to produce three ounces of heavy water. The new substance has become one of the most

TEST CHAMBER

These men are being examined in a special test chamber built at the Military Medical Academy, Leningrad, in preparation for the stratosphere ascension.

valuable known in the commercial field. A price of $150 is asked for a gram. At this rate a teaspoonful is worth nearly $600; a quart, $150,000. Princeton now has on hand about a glassful and is about to raise its production to a thimbleful a day.

What effect the drinking of heavy water will have on animals and human beings is not yet known, but it is believed that it may bring on a fever, and therefore might be useful in diseases that are treated by raising body temperatures.

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DOWN TOWN DISTRICT

Looking over the ruins of Minturno, Italy, where an American expedition is finding much buried history. The theater in the foreground was a gift to the city from the Emperor Augustus, as a peace offering because the city was aroused over having to look out for a detachment of returned soldiers. The outer wall of the theater was divided into 24 shops, arranged in a semi-circular arcade. One of the shops was converted into a Christian chapel and a bronze tablet with small Christian crosses has been unearthed in it.

RADIOLOGY

Birthmarks Permanently and Safely Treated By Radium

MOLES, birthmarks and similar masses which are known to physicians under the name of nevi may for the most part be safely and permanently removed by radium treatment, it appears from the experience of Dr. William S. Newcomet, Philadelphia radiologist. Dr. Newcomet reported to the American Congress of Radiology the results he had obtained in treating such cases during the last fifteen years.

"There is a well grounded idea existing among the laity that to treat a nevus is to invite malignancy," said Dr. Newcomet. "Yet it is a well established fact that many cases of malignancy start from nevi. Unfortunately, even with the publicity that has been given to this subject, there still remains, among a certain class, a constant fear that it is dangerous to remove nevi."

Dr. Newcomet prefers radium to X-rays for treating these cases on account of the susceptibility of the surrounding parts of the body and also because it is easier to confine the effects of radium to a more limited area. In fact, he stated that these marks should always be irradiated with radium, never with X-rays. Occasionally the radium treatment must be followed by surgery to remove scars in the case of very large marks. Sometimes when the patient has been treated in childhood, some slight deformity has resulted in adult life from lack of development of the affected part or because some of the natural tissues were replaced by the tumor mass. These cases are comparatively rare, Dr. Newcomet finds.

"In the majority of cases results of treatment were very satisfactory," he declared. "The marks or tumor masses had disappeared; the site was practically normal and without scar. No other method could accomplish so much and, while the treatment is not so rapid as some other method, results are better.

"These lesions are not dangerous to life, therefore there is no justification for the employment of any dangerous procedure. In conclusion the fact is stressed that in all cases the mild application of radium may bring about a diminution of the tumor mass and it should always be used previous to operation. . ."

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ARCHAEOLOGY

Ruins Shed Light On Rome's "Bonus Army"

ARCHAEOLOGISTS excavating the ruins of Minturno, Italy, have dug up relics of evidence showing how the Roman Empire solved one "bonus army" problem. The evidence is found in the city's water pipe system which has been investigated by the University of Pennsylvania Museum expedition to Minturno, led by Dr. Jotham Johnson.

Dr. Johnson, who has just returned to Philadelphia, said that a length of lead water pipe was found bearing the name of the slave who made it. It dates back to a period in the career of Augustus between 40 B.C. and 14 A.D. The Emperor Augustus had sent some returned soldiers, "bonus army" men as it were, to the vicinity of Minturno, about 100 miles south of Rome. This aroused the people of Minturno to great discord and dissatisfaction. To appease the city, the Emperor presented it with an acqueduct and theater. The city thus acquired "modern" plumbing, with water under pressure in the pipes. Dr. Johnson remarks that it is significant that the wells previously used, were filled in.

The lead pipes were made from sheets folded over and clamped. The lengths as originally found varied from six to twenty feet according to diameter. About 18 tons of this ancient pipe were excavated by peasants during the World War and sold as scrap metal.

When Minturno acquired its improved water system, it had already had a most elaborate system of sewers for about a hundred years. So extensive and complete was this sewer system, says Mr. Johnson, that the expedition could survey much of the city from beneath the ground by setting by surveying instruments inside the big sewers. In this way, surveying of Minturno has been completed long before the ruins are all uncovered.

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ZOOLOGY

World's Biggest Reindeer On Island of Sakhalin

THE WORLD'S largest reindeer live on the island of Sakhalin, which lies between the Sea of Japan and the Sea of Okhotsk off the coast of Siberia. According to Arthur A. Yust, a leading Russian reindeer breeder, the biggest male animal ever found in the Sakhalin herds had a weight of approximately 450 pounds, which is nearly twice the weight of ordinary reindeer. Females of the Sakhalin reindeer average around 280 pounds, but specimens weighing about 360 pounds have been found.

Mr. Yust has made a systematic study of the reindeer that range clear across the vast sub-polar stretches of the U. S. S. R., and has distinguished nine separate varieties or subspecies.

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PSEUDO-HISTORY

Plato Devised Atlantis Myth, Scholar's New Study Indicates

THE LOST continent of Atlantis! How many times has human imagination been stirred by thoughts of a huge island in the Atlantic Ocean, suddenly engulfed by the sea in a horrible day of earthquake and flood? Was there ever such a place, or was Atlantis a myth?

So much has been written arguing for and against, that Prof. W. A. Heidel, Greek scholar of Wesleyan University in Connecticut, brings up the hackneyed theme apologetically. His justification for mentioning it, he says, is that he has a new suggestion to offer.

Studying Plato's dialogues, where the Atlantis story got its start in writing, Prof. Heidel believes he can discern what was in Plato's thought as he framed the story that was destined to puzzle and intrigue the world. The story of Atlantis, concludes Prof. Heidel, was fiction devised by Plato. Greek pride caused him to put in some details. And there was an air of playful irony in the telling.

The philosopher Plato was teaching how the ideal republic would function in the crisis of war. To make the argument real, he asked his audience to suppose the citizens of the ideal republic to be their venerable ancestors in a very ancient Athens. And then he outlined the drama of primitive Athenians, 9,000 years before, engaged in conflict with people from the great island Atlantis, and as an epilogue he told of sudden disaster which plunged Atlantis into the depths of the sea.

What has misled some scholars into thinking that Plato might be talking about a real country, says Prof. Heidel, was Plato's statement that he got his facts about Atlantis from the Egyptian priests. Egypt, to the ancient world, was the land of the oldest wisdom, the priests were the great authorities. But, Prof. Heidel's interpretation is that Plato attributed Atlantis to the Egyptians merely to give weight to his words and a touch of realism.

"Like accomplished creators of fiction in all ages," says the Professor, "he multiplies the circumstances which give versimilitude to his story."

Moreover, Plato seems to have enjoyed taking a dig at the Egyptian wisdom and antiquity. For he proudly makes his primitive Athens a thousand years older than an Egyptian town in the narrative. And as he tells of the struggles between the Greeks and the conquering armies from Atlantis, he says that Greece defeated the invaders and liberated all the inhabitants of Europe and Africa.

Since Plato is the only writer of antiquity who refers to Atlantis, the solution of the Atlantis problem is most likely to be found in his direction, Prof. Heidel believes. As in the children's game of hide-and-seek, the seeker would seem to me "warm" when investigating Greek history and geography, in order to see what ideas were borrowed and used to make a "lost continent." And, considering that Plato had no modern knowledge of the world's geologic history, and could scarcely have held theories of land bridges in the Mesozic era, the Atlantis seekers who approach the problem geologically are "cold"—so far as their chances of explaining Plato's Atlantis are concerned.

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ANIMAL PSYCHOLOGY

Animals Know Phonograph Voices of Own Species

"HIS MASTER'S Voice" is not just a bit of clever advertising; animals do recognize the voices of their own and other species when played on a phonograph record. So reports Prof. Bastian Schmid of Munich in the German scientific publication *Die Umschau*.

Prof. Schmid tried a phonograph record of a mewing cat on a fox terrior that hated cats. As soon as he heard the voice of his pet antipathy he tore around the room hunting for it, and when he found the phonograph horn he tried to dive into it. The same record was then tried on a cat, which listened for a moment and then responded with the same melancholy meowling.

Another record, of a hen cackling just after she had laid an egg, was tried on a farmyard rooster. He responded immediately with the same egotistic cackling that a henyard sultan sets up when one of his wives has boosted her laying record by one unit.

Prof. Schmid also tried a record of a watchdog's barking on the dog himself. After a moment of astonishment the dog began to bark in reply, but in a different tone. A young ape, hearing a record of his own voice, also treated it as the voice of a stranger. Prof. Schmid is inclined to believe that animals will recognize their own voices as belonging to their own species, but not as belonging to themselves.

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LINGUISTICS

Cambridge Man Explains Oxford Accent

AN EXPLANATION of the Oxford accent, so generally accepted as the brand of "culture," has just been offered by a Cambridge graduate, H. St. John Rumsey, instructor for speech defects at Guy's Hospital, London.

The accent is a drawl, prompted by a peculiar state of mind, and anyone can imitate it merely by tensing the muscles of the throat instead of relaxing them. Such faulty technique in voice production produces the weary tone without the prerequisite of three years attendance at an English university.

"The speech mannerism which has been called the Oxford accent," declared Mr. Rumsey, who is an expert in phonetics, "is not due to any incorrect mouth shapes, but to the basic vocal tone which gives an impression of weary boredom with life in general and the immediate audience in particular."

However, Mr. Rumsey has found more Oxford drawls among the artistic young men of Chelsea, London, than in the two old universities of Oxford and Cambridge combined.

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ANTHROPOLOGY

Mexico Studies Mixed Breed Problem

WHAT HAPPENS when races mix their blood is being studied scientifically in the case of Otomi Indian and Spanish cross-breeds in villages of the Ixmiquilpan region of the State of Hidalgo. How the mixed breeds of human beings reproduce themselves in comparison with the pure races from which they sprang is being measured. The results of the investigation are expected to throw some light on the disputed question as to whether hybrids or pure breeds are best.

A sociological study of Mestizo and purely Otomi families form the basis of the study. Birth and death data and other information three generations back is being gathered. The economic and health conditions of each family are also brought into the picture. These latter are important factors in population progress, for they influence the trend which might be due to race alone. Anthropometric measurements covering the entire family, in each case studied, are likewise being made.

The expedition making the investigation is directed by Dr. Conrado Gini, professor of demography and sociology in the University of Rome. Other Italian scientists taking part are Prof. Giuseppe Genna, anthropologist, and Dino Camavitto, sociologist, likewise from the University of Rome. The Mexican government is cooperating officially, by detailing medical and other technical personnel, who form the majority of the expedition of twenty. A female nurse accompanies each doctor because women instill more confidence among primitive groups than men alone, and because native women who must be examined often object to being measured by men.

Science News Letter, October 14, 1933

BACTERIOLOGY

Tests for Food-Spoiling Germs Need Standardizing

TESTS for bacteria that cause foods to spoil need to be standardized, members of the American Public Health Association were told by Lawrence H. James of the Bureau of Chemistry and Soils, U. S. Department of Agriculture.

Mr. James termed such standardization a "present necessity." It will aid in the better protection of the health of the consuming public. It will also pave the way for the development of improved methods of food preservation.

"The quality and safety of many foods depend upon the control of spoilage bacteria, yeasts and molds," he said.

At present, different laboratories use different methods for detecting these organisms. No detailed directions, simplified and standardized for general use, are available. Every state in the Union conducts some type of official food analysis and practically all cities of metropolitan size, with populations of 500,000 and over, maintain food analytical laboratories. In addition, many college, university and consulting laboratories are called upon to make analyses in which they have had but little experience either with the food products or with the special methods required.

Mr. James reported that a committee of the American Public Health Association of which he is chairman, has secured the official cooperation of that organization, of the Society of American Bacteriologists and of the Association of Official Agricultural Chemists in organizing a group of experts on food bacteria to develop standard procedures for the microbial analysis of foods.

Science News Letter, October 14, 1933

IN SCIEN

METEOROLOGY

Twin Hurricanes Boost Total to Eighteen

THE SEASON'S third pair of hurricane twins, developing locatable centers on Tuesday, Oct. 3, raised the 1933 record for tropical storms to a new all-time high, both for total number of these big disturbances and for the number of them found travelling in pairs. So C. L. Mitchell of the U. S. Weather Bureau reported. Eighteen major tropical storms are now on the 1933 slate, as against sixteen for 1887, the next highest year of record. And there is still at least a month to go before the hurricane season closes.

The major disturbance, coming almost straight north out of the Caribbean, centered near Havana on Wednesday, Oct. 4, with wind velocities as high as 72 miles per hour. The second hurricane area was reported out over the Atlantic in the neighborhood of Turk's Island, believed by some geographers to be the first land sighted by Columbus.

Science News Letter, October 14, 1933

ECOLOGY

Lake in Yellowstone Has Floating Island

CRESCENT LAKE, in Yellowstone National Park, has a mysterious island that for long has been observed to change its position constantly.

Recently park rangers believe they have solved the mystery. After examining the island closely, they have come to the conclusion that it is made up solidly of rushes and beaver cuttings which have become bound together over many years by plant growth.

At the present time beaver are piling the island surface with new cuttings and the rangers believe eventually a new gigantic beaver hut will be erected on the floating island. Indications are that the beaver are attempting to anchor the island solidly to the floor of the lake, but so far it remains unmoored. Eleven adult beaver inhabited the lake during the past summer.

Science News Letter, October 14, 1933

ENE FIELDS

PUBLIC HEALTH

50,000 Indians Blinded By Bite of Red Fly

THE BITE of a little red simulid fly has brought blindness to some 45,000 Indians in Chiapas and 5,000 in Oaxaca, according to the Mexican Health Department.

The life history of the parasite which the fly deposits in the blood of man is now known, but no good remedy to combat it has been worked out.

Because the Oaxaca region is small, Health Department brigades have chosen it as a field of experiment. The larvae of the flies are found among dead leaves along creek and river banks, and by cleaning these and burning the debris some impression has been made on the blindness epidemic.

Tumors appear on the heads of those affected, and these are being operated on by the wholesale by the sanitary brigades. This eventually cures the individual if the disease has not gone too far. The tumors are filled with long, thin, coiling organisms that can be seen by the microscope. Being phototropic, or light-loving, these make their way to the eye. Indians with affected eyes are almost blind in the sun, but see better at night.

Science News Letter, October 14, 1933

PHYSIOLOGY

Paprika Acid, Probably Vitamin C, Cures Scurvy

AN ACID prepared from paprika cured a man of scurvy when injected into his veins, it appears from a report by Dr. Poul Schultzer, resident physician of the Copenhagen Municipal Hospital, to *The Lancet*.

The acid is ascorbic acid. It was formerly known as hexuronic acid and is generally thought to be identical with vitamin C. This is probably the first time it has been used to cure the disease, which results from lack of vitamin C.

The acid was isolated from plants and from the adrenal gland cortex by Szent-Gyorgyi. He and other investigators in Europe and America have reported its scurvy-preventing power in animals.

Dr. Schultzer's patient was a married man 68 years old, a former blacksmith who had been living for sime time on a diet which was lacking in the scurvy-preventing vitamin C. He never took milk or any dishes prepared with milk and never ate any potatoes, vegetables or fruit. The man came to the hospital with typical symptoms of scurvy, which grew worse when he was kept on a diet known to be deficient in vitamin C.

Injections of ascorbic acid, prepared from the paprika plant by Szent-Gyorgyi resulted in rapid recovery.

Science News Letter, October 14, 1933

BIOCHEMISTRY

X-Rays Render Water Poisonous to Protozoa

X-RAYS played upon water or nutrient fluids make them deadly to protozoa by producing very small quantities of hydrogen peroxide. Experiments in which this fact was discovered are reported in *Physiological Zoology* by three Stanford University zoologists, Dr. C. V. Taylor, J. O. Thomas and M. G. Brown.

Experimenters first discovered that if they X-rayed a nutrient solution and then put in the species of protozoon they were using, *Colpidium campylum*, the animals died, despite the fact that the deadly rays never touched them. They found the same fate following their protozoa in X-rayed water.

They tested both the culture fluid and the water with titanium chloride, a compound extremely sensitive to the presence of hydrogen peroxide. The test indicated hydrogen peroxide in very small quantities—on the order of one part in a hundred thousand of water. The addition of one part of hydrogen peroxide to 450,000 parts of water rendered it toxic to the protozoa.

Then they tried the effect of X-rays on highly purified water from which all possible traces of dissolved oxygen had been removed. This water did not prove toxic to the protozoa. Water to which organic colloids, like sheep blood or agar, had been added was not rendered toxic by X-rays.

Recognizing that X-rays may also produce other toxic substances, the experimenters nevertheless regard the production of hydrogen peroxide by X-ray action as of considerable significance in the known deadliness of X-rays to protozoa and other types of cells.

Science News Letter, October 14, 1933

PEDIATRICS

Weather Affects Length of Time Children Sleep

THE LENGTH of time children sleep is affected by the weather, naps being noticeably longer on rainy days, as any mother may have noticed. Scientific observations of how the weather affects children's sleep were made by Eunice Pierce, trained instructor at a preschool center of the Cleveland Child Health Association. The experiment was conducted in four nursery schools at Cleveland and extended over a period of six months.

Boys tend to sleep longer than girls, Miss Pierce found, but the length of time children sleep is variable.

Nap lengths drop tremendously on the first day of severe weather change, either hot or cold, but the sleep goes back to normal if the extreme cold or heat lasts for more than one day.

Other of Miss Pierce's conclusions, reported in the *American Journal of Public Health*, are that sleep falls off markedly before an illness and that the two and three-year-olds do not sleep longer as an average than the four and five-year olds.

Science News Letter, October 14, 1933

BOTANY

Florida Cacti Grow in Swamps

CACTI that grow in swamps are the strange plants described and pictured by Dr. John K. Small, veteran student of Southern botany, in the *Journal of the New York Botanical Garden*.

Although most of us think of cacti as belonging to the desert Southwest, actually these curious jointed fleshy plants occur in many other parts of the country, and are especially abundant along the seashore. Some of the cactus species which Dr. Small has found in Florida grow perfectly contentedly in tidal salt marshes on both coasts of the peninsula, where the water and the soil are always saline. The same species grow in the middle of the peninsula where the soil is not salty at all and the water not excessive.

Other Florida cactus species studied by Dr. Small did not find the wet soil to their liking, and have taken to roosting on the limbs of trees, like orchids or Spanish moss.

Science News Letter, October 14, 1933

PHYSICS

Beyond Einstein

Thought of the "New Deal" in Physical Science Has Outstripped Even Theories of the Famous Relativitist

A "NEW DEAL" has been called in that branch of science known as physics. Those who studied their science before the World War and even those who have not looked into the field of physics in the last few years will need a guide. It has even gone beyond the relativity ideas of Einstein that created the revolution in scientific thought in the few years following 1919.

Yet strangely enough this newer deal that is puzzling scientific minds began in a large measure in the brain of Prof. Albert Einstein when in 1905 he applied the quantum theory that Prof. Max Planck had introduced earlier.

Just as the Einstein relativity theories set lay and scientific heads to buzzing, so the development of theories about the nearly infinitesimal in science, which have culminated in what is known as the "quantum wave mechanics," involve deligh'ful paradoxes that puzzle both lay and scientific minds.

This new quantum wave mechanics is so complex that even the simplest fundamental process can not be pictured and is expressible only by means of mathematical symbols. But the many paradoxes brought out by this new treatment are mentally intriguing to examine and discuss in an approximate and unmathematical way.

Bohr Began New Deal

The new deal really grew out of the admirable adaptation by Prof. Niels Bohr, Danish Nobel prize winner, of the bare quantum theory postulates of the early twentieth century to the problem of atomic structure. The Bohr atom as further developed by Prof. Arnold Sommerfeld served the physicists as a working model with fair success until about 1925. Then the paradoxes became overwhelming. Something had to be done to the theory.

A group of young geniuses arose. The development began in Europe with Prof. Werner Heisenberg leading a new attack that in the hands of Born and Jordan led to the "matrix mechanics." Prince Louis de Broglie began an attack from the viewpoint of wave action that was carried on by Schrodinger to the "wave mechanics." Both were shown to be equivalent to one general scheme now christened the quantum mechanics. This theory has been pushed forward very vigorously by Profs. P. A. M. Dirac, W. Pauli, George Gamow and many others in Europe and by Prof. Edward U. Condon, Prof. J. Robert Oppenheimer, Prof. John C. Slater, Prof. Geo. E. Uhlenbeck, Prof. John H. Van Vleck, Prof. Paul S. Epstein and a host of others in this country.

Building Blocks

What is everything, stars, earth, plants, people, made of? In the final analysis everything consists of small bits of electricity. This is one of the latest developments of the new deal in physical science.

The most publicized electrical particle is the electron, the unit of negative electricity. Its movement constitutes an electric current. This electricity is so highly concentrated that it appears to weigh a minute amount, so small that it would take 33,000,000,000,000,000,000,000 electrons to weigh a millionth of an ounce.

The other familiar building block is the proton which carries an equal positive electrical charge but weighs about 1,850 times as much as the electron.

Older pictures of the atom were satisfied with a model having protons and electrons in the core or nucleus of this chemical entity and more electrons revolving about the outside much like the planets revolving about the sun.

To illustrate the minute dimensions of the atomic heart physicists say that if all the nuclei in a man's body could be packed together they would not be any larger than an almost invisible speck of dust, yet this mite would weigh nearly two hundred pounds. The rest of the space is "filled" with the electrons outside the nucleus, but since the old school of physicists thought that the relatively huge electron had a diameter of only one ten-thousandth of the atom the world is mostly "holes" occupied by particles that are never exactly anywhere.

The enigma of how the large electron could be squeezed into the minute nucleus has been overcome by the recent discoveries of the neutron and the positron. The neutron is the most unique building block since it has no electrical charge although it has the same weight as the proton. By assuming neutrons and positrons alone in the nucleus or atomic heart, physicists can account for the proper weight without crowding things too much.

The positron is the counterpart of the long-known electron in that it seems to have the same mass but the opposite electrical charge. Physicists have no place for it in the external structure of the atom and are attempting to squeeze it in with the other nuclear constituents.

Knowing the Invisible

If something cannot be seen, it can be described only by how it acts. The minute particle of electricity or matter, the electron, is certainly too small to see and seems to be too small to make a showing by itself.

For these reasons physicists are in a quandary as to the exact nature of this fundamental particle. Or is it a particle? On Mondays, Wednesdays and Fridays they think of it as a tiny corpuscle and on Tuesdays, Thursdays and Saturdays it seems to be a wave. This is one of the consequences of the "new deal" in physical science.

The most modern description of an electron is that it is both, and the pic-

▼ RADIO ▲

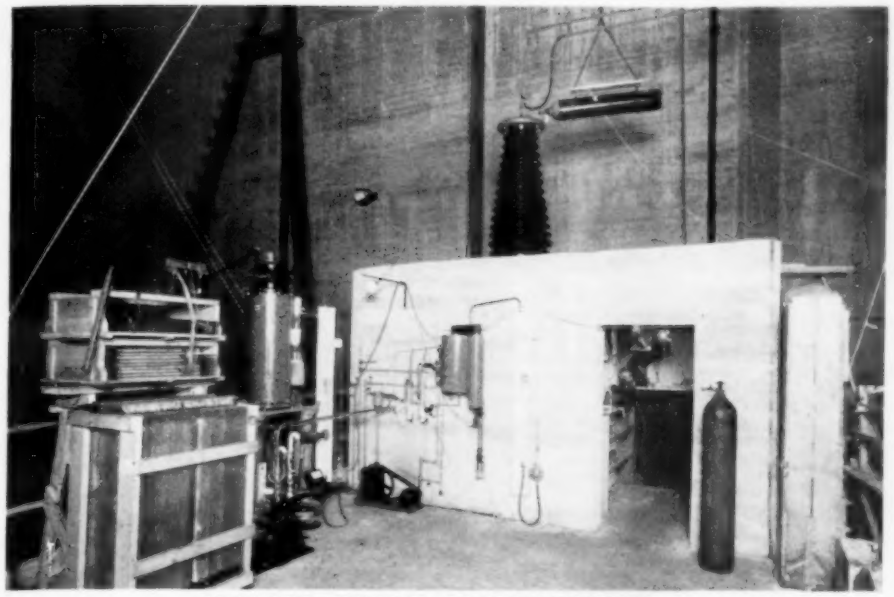
THE OCEAN

an address by

Dr. Paul S. Ga'tsoff

of the Bureau of Fisheries, U. S. Department of Commerce

To be given Friday, Oct. 20, at 3:00 p. m. Eastern Standard Time over stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.



PROVING GROUND OF NEW THEORY

This picture shows a portion of the laboratory of the California Institute of Technology, a typical workshop of physicists of the "New Deal." Here large quantities of neutrons were obtained from the disintegration of the metal beryllium with artificial alpha rays or hearts of helium atoms. With the compact and relatively inexpensive X-ray tube made of the transformer insulator protruding above the concrete hut, helium gas escaping from the small horizontal tank above was speeded up to form the artificial alpha particles.

ture of this combine presents strange features to explain the known effects. Physicists imagine it to be like a tiny spider, which represents the point particle, that is at the center of a gossamer web which is analogous to the wave. The wind, which represents external influences, blows on the webbing and guides the energy-containing spider about with it. Thus the electron is influenced by neighboring atoms through the medium of these widespread tentacles although it may never pass very close to them.

The wave associated with an electron may be considered as a wave of probability and the places where the wave is strongest are places where the electron is likely to be.

The Uncertain World

"Meet me at the corner of 42d Street and Broadway at 8 p. m. today and jump on my auto as it runs along at 10 miles per hour."

Any agile friend could be expected to keep that date with great certainty. But not so with any fundamental particle of matter or bit of electricity as viewed in the latest theories or the "new deal" in physics.

The physicists have decided that it is impossible to know just where an electron is and at the same time to know with great precision its speed of travel. This, roughly stated, is the uncertainty principle or the principle of indeterminancy as formulated by Dr. Heisenberg, young German physicist.

This is quite upsetting to the older idea of physics. Physics professors of a few years ago taught that all was definite and measurable in their best of all mechanical worlds.

The uncertainty principle states that no physical measurements on a particle are capable of providing absolutely precise knowledge of the simultaneous values of the position and momentum which is the product of the mass and the velocity. If scientists wish to obtain a high degree of accuracy in the measurement of one of these quantities then they are forced to be content with only an approximate value of the other and vice versa.

Least Possible Work

What is the least amount of work that can be done and yet be called the using up of energy? That might be thought of as a question suggested by the drive for shorter working hours. Atoms have always operated under a minimum energy code. So physicists believe, who call the unit of energy the quantum.

An atom does work or gives off energy by shaking its parts into vibration or by having an internal explosion. The effects of this disruption travel out through space from the atom as a wave and work on the target atoms that the wave strikes.

The useful photoelectric cell that is the mechanical eye of many robot devices is one application of the working of this wave. For the excitement in the working atom is nothing more than the emission of light and the waves that spread out from the source are a beam of light. When this light falls on the photoelectric cell the work that is done is the removal of an electron from the metal plate in the cell.

But that is a definite task and requires a known amount of energy, much more than is contained in that portion of the wave front that crosses the target atom at any one instant. Physicists showed that the assumption that the target atom stored up sufficient energy for the electron's release over a long time before the escape took place is not correct and that the action is instantaneous because a feeble light will cause an immediate response.

The modern explanation of this paradox is that the energy in the light beam has a certain probability of being located at a single point on the advancing wave front and if it so happens that this amount of energy is a quantum sufficient for the release of a target electron then the photoelectric emission can occur.

Cosmic Ray Uncertainties

In celestial space, millions of light years from the earth, cosmic rays are the chief source of energy. From 30 to 300 times as much energy would fall on a body at that almost imaginary point in the form of this mysterious radiation as would come from all the stars in the universe.

What is it that makes them so mysterious and why should it be necessary to climb the Andes and float to the stratosphere to measure them?

There are two distinct theories of the nature of this most penetrating radiation. Dr. Robert A. Millikan, Nobel prize winner at the California Institute of Technology, believes that they are largely bullets of waves similar to ordinary light but of an enormous frequency; whereas Prof. A. H. Compton, Nobelist at the University of Chicago, believes that they are largely electrically charged particles moving with enormous velocities. Dr. Millikan's theory proposes that these photons or light wave bullets were emitted by the for-

mation of heavy atomic hearts from the hearts of lighter atoms. Another theory, stated by Abbé Georges Lemaitre, the Belgian physicist, attributes them to the original explosion of the universe, and he postulates that the original fragments of this explosion that are still flying about may be the cosmic rays.

Balloon flights, both manned and unmanned, study the effects of the cosmic rays and see if they increase with altitude. Physicists have thought that if the primary cosmic rays are photons these effects should reach a maximum intensity and then fall off to zero as the surface of the atmosphere is reached. However if they are electrically charged particles the effects will increase steadily and approach a maximum at the top.

Measurements up to the present have shown definitely that charged particles are present but they do not exclude absolutely the photon hypothesis. It is the hope of scientists that a successful high altitude flight will decide this question and that is the chief reason for all the effort expanded on these ventures.

New Ideas on Reducing

A champion may lose five pounds in a Davis Cup tennis match but atoms lose very little weight when they dissipate energy. Strangely enough if they move fast enough they appear to gain weight.

Physicists believe that weight or mass and work or energy may be one and the same thing. When atomic hearts are broken down or built up mass may disappear with the emission of enormous amounts of energy. Conversely energy exerted in causing the change may appear in the form of a heavier atom core. First it is work and then it is weight, or perhaps work again.

The simplest relativity theory predicted that if an elementary particle such as the electron were speeded up to velocities approaching the velocity of light, 186,000 miles per second, it would become heavier and heavier. If it could be made to go at just that speed, which is the maximum speed limit in the universe, it would become infinitely heavy. This is just another way of saying that it is impossible to break that ultimate speed record, more than seven times around the world in less than a second.

Trick Mountain Climbers

Why not slip through a mountain instead of climbing over it, and then pull the hole shut after you?

This sounds impossible for any human to do, but physicists struggling with the "new deal" in their science have decided that this is an approximate picture of the way captive particles escape from the valleys that are the centers of all atoms. It would take about 25,000,000,000,000 of these hollows and ridges placed side by side to cover only one inch. The captive particles do not have enough energy to climb over the barrier but they do get out. The only conclusion is that they must have found a tunnel that existed for only an instant and were clever enough to seize the opportunity.

The cores or hearts of all atoms are pictured by mathematical physicists on the basis of energy considerations and to help visualize their abstract symbols they draw a picture of this nucleus that looks like a valley between two mountain peaks. The constituents of the atom heart are trapped in this depression and are held captive for all time if the atom is stable.

Some atoms, such as radium, do break up and these fragments come flying out of the valleys with enormous speeds. But they have to be shot back at the mountain with much higher speeds in order to return to the core.

This return speed determines the height of the mountain.

These valleys and mountains are called potential energy functions and the new theory interprets the leakage of particles from within as due to a finite probability of escape from the zero energy state at the bottom of the valley to a slightly higher energy state at the outside foot of the potential barrier.

Science News Letter, October 14, 1933

OPTICS

Metallurgist Devises New High Precision Microscope

AN AMERICAN metallurgist whose skill with the microscope has won world acclaim has just announced another of his triumphs over the invisible. Francis F. Lucas of Bell Telephone Laboratories has reported on his newest invention, a microscope capable of the highest precision at magnifications of 5,000 times, before a congress of metallurgists.

The microscope and its accessories for the examination of metals required four years to build in the Zeiss works of Germany. The chief feature of the microscope is its rigidity which eliminates vibration. Three long benches suitably mounted on wheels and with shock absorbers galore support the apparatus. Refinements never before attempted are built into the instrument.

Among the refinements which have been made available in this equipment for regular use are: absolutely pure monochromatic light, mono-bromnaphthalene for a principal lens, specially rugged and accurate focusing mechanism, and the suppression of distracting noise from the spark gap.

The equipment is installed in a light-tight laboratory having an enameled interior reflecting only definite wavelengths of light not detrimental to the use of the microscope.

Science News Letter, October 14, 1933

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ZYMOLOGY

Drink Half-Per-Cent Beer, and Like It!

WHILE America welcomes back "3.2," and looks forward to stronger tipple soon, beer-loving Bavarians in Munich are sampling a new brew with only one-half of one per cent. of alcohol—and liking it!

The new drink is not like the "near-beer" of prohibition days in America, though its alcohol content is the same. Near-beer was made by boiling the alcohol out of real beer and then re-charging it with carbon dioxide. The new German "nothing-point-five" is the completed product of a natural fermentation, with no artificial manipulation. It has a grand "collar," it tastes good, and there isn't a katzenjammer in a tank-carload.

The beverage is not made with yeast, but with a bacterium species discovered by Prof. Paul Lindner of Berlin. The same organism was used in the ancient East to make a drink called "soma" which was supposed to be the nectar of the gods. It is also used by the modern Mexicans in the fermentation of a mild beverage made from the juice of a species of century plant.

Working under scientific sanitary conditions with pure cultures and controlled temperatures, several prominent breweries in various German cities and in Vienna have recently begun the brewing of this bacterial beer. It hasn't a kick, but nobody's kicking.

Science News Letter, October 14, 1933

GEOGRAPHY

Ancient Map is Really Only Half a Map

THE OLD MAP of the Atlantic Ocean and lands bordering it, pictured on the front cover of SCIENCE NEWS LETTER for October 7, is really only half a map, but fortunately it is the half that throws light on Columbus' voyages and the explorer's views of his discoveries.

A printer's oversight resulted in the printing of the map up side down in SCIENCE NEWS LETTER. Thus the hand-written inscription in the upper right corner should be in the lower left. The lands to the right represent parts of Africa and Spain while those in the upper left outline portions of America as they appeared to Columbus.

The map was originally a gift of the Turkish seaman and author, Piri Re'is, to his Sultan, Selim the First, as the most authoritative and new representation of the then-known world. In the years that have passed since 1513, when the chart was drawn, the half dealing with Europe and Asia has been torn off, probably by a Turkish ruler most concerned with his own part of the world.

The Arabic inscription in the lower left corner explains that Piri Re'is drew the map copying the New World lands from charts that Columbus, himself, had made. They were probably captured by Re'is' uncle, the great naval hero, Gazi Kemal. Information was also furnished by a Spanish slave who said he had traveled with Columbus three times to the new territory.

The importance of the map to modern geographers is explained in last week's SCIENCE NEWS LETTER.

Science News Letter, October 14, 1933

PHYSIOLOGY

Milk Seen as Constant Source of Vitamins

MILK, as produced under present market conditions, is a fairly constant source of all the vitamins except the rickets-preventing D and this can be added in a number of ways, Prof. H. C. Sherman of Columbia University told the American Public Health Association.

Man has been able to extend his learning period much longer than other animals chiefly because of his use of cow's milk for food, Prof. Sherman declared.

The body cannot produce vitamins by itself in the way that it can and does produce enzymes and hormones. Either the vitamin or its precursor must be furnished by the food or some other factor of the environment, such as ultraviolet

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[October 21, 1933]

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light in the case of vitamin D.

In the case of the cow, the rations which are economically profitable for the dairy farmer to feed are almost always of fairly high vitamin A content, and in addition the cow is able to store a surplus of this vitamin in her body, so that cow's milk is both a highly important and a highly reliable source of vitamin A, Prof. Sherman explained.

The rations which are found profitable in modern milk farming are also sufficiently rich in vitamin B to make it fairly certain that the cow's milk will also be a constant and reliable if not outstandingly rich source of this vitamin. This is the more certain because the digestive tract of the cow furnishes a favorable environment for certain vitamin B-producing bacteria, so that the cow may continue to produce milk of normal vitamin B value even when her food lacks this vitamin.

Milk is also a reliable if not rich source of vitamin C.

The amount of vitamin D in cow's milk may be increased either by adding vitamin D concentrate to it, by irradiating the milk with ultraviolet light or by feeding yeast or other suitable irradiated material to the cow. Recent work shows that the vitamin D content of the milk may also be increased by exposing the cow to ultraviolet light.

There is also considerable evidence that milk as ordinarily produced is a rich and reliable source of vitamin G, important in the prevention of pellagra.

Science News Letter, October 14, 1933

PSYCHOLOGY

Tests Show Qualities Of Good Salesmen

TESTS OF 500 life insurance salesmen, both successful and unsuccessful, show that many of the popular ideals of what it takes to make good in this line are well founded. Others are not.

Good salesmen were found to have more self-confidence, enthusiasm, speed of decision, certainty of opinions, non-intellectuality, ascendance, sociability.

But—believe it or not—good salesmen do not have the greatest amount of persistence. They are not more outstandingly of that extrovert or interested-in-others type of personality. And they rate themselves low in tact.

These are results of the tests conducted by Dr. Arthur W. Kornhauser of the University of Chicago.

Science News Letter, October 14, 1933

EPIDEMIOLOGY

Rabbit Tick May Have Spread Spotted Fever Over Country

Suspected Carrier Found Widespread But Does Not Bite Man; Official Reports Observations at Home of Disease

A RABBIT TICK with the impressive name of *Haemaphysalis leporis-palustris* may be the mysterious agent that has spread the deadly Rocky Mountain spotted fever from its original haunts in the Bitterroot Valley of Montana to the Pacific and Atlantic coasts.

This new explanation for the recent wide spread of the highly fatal disease was suggested by Dr. R. R. Parker of the U. S. Public Health Service at the meeting of the American Public Health Association. Dr. Parker is in charge of the spotted fever investigations of the federal health service at Hamilton, Mont., where serum for protection against this disease is manufactured.

Dr. Parker also pointed out the effects of meteorological conditions and changing agricultural practices on the prevalence of the disease. For instance, in the Snake River Valley sheep raising was the only form of agriculture for many years. Men engaged in this occupation are particularly exposed to bites of the Rocky Mountain wood tick that carries the disease, and there was a high percentage of cases among the sheepherders. Now sheep raising has been almost crowded out by more intensive forms of agriculture, such as dry land wheat raising, which are less favorable to spotted fever, and fewer cases are being reported.

Irrigation and the gradual grubbing out of the sage brush and intensive cultivation of the land have created conditions less and less favorable for ticks, and cases of the disease are now infrequent in this valley. One physician who used to treat between 35 and 50 cases a year now sees only from one to three cases in a year. In addition, vaccination of the sheepherders and local campaigns against the rodents that harbor the ticks are reducing the cases.

The rabbit tick, which Dr. Parker suspects of being a factor in spreading the disease across the country, does not bite man, as do the Rocky Mountain wood tick and the dog tick, which transmit the disease in the East. However, the infection, kept alive by the rabbit tick with the long name, may be picked up by other rabbit ticks that do bite man. Dr. Parker has found the virus of the disease consistently in the particular rabbit tick he suspects, and he pointed out that this tick is widespread in the United States and other parts of North America, whereas the Rocky Mountain wood tick does not range far from its mountain habitat.

The disease was presumably prevalent in the Rocky Mountain region long before this part of the United States was settled, Dr. Parker said. It was not commonly recognized until the late 90's. It is now found in all the Pacific Coast states and all the Rocky Mountain states; in parts of Minnesota, Iowa, North and South Dakota, Nebraska, Tennessee, Louisiana, possibly in Missouri, in Alabama, Oklahoma, Arkansas, the District of Columbia, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North and South Carolina, and Indiana. This wide distribution has been of great concern to health officers, particularly since they have not yet been able to find the way in which the disease has been spread.

Science News Letter, October 14, 1933

PUBLIC HEALTH

300 Plague Deaths In One Chinese Village

AN OFFICIAL report of 300 deaths from bubonic plague in the area of Nungan, China, since August has just been received by the U. S. Public Health Service in a cable from the International Office of Public Hygiene, Paris. Quarantine officers state that at least twice as many cases as deaths must have occurred and that in a country like China, where reporting of communicable diseases is unsatisfactory, at least ten times as many cases as reported deaths may be safely estimated. That would indicate some 3,000 cases of bubonic plague had occurred in the one area since August.

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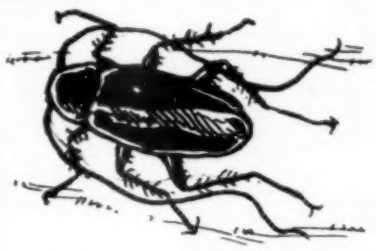
NATURE RAMBLINGS
by Frank Thone

ENTOMOLOGY



Champion Conservatives

ISN'T IT ODD how long insects have been in the world without undergoing any essential changes!

Compared with the insects, man is a parvenu, and all his mammalian kin are creatures of yesterday. There is a pretty clear certainty that human beings have inhabited the earth for at least 50,000 years, and there is evidence enough to justify conjecture that he has been here 500,000 years or more. The very earliest and most primitive of mammals, little mouse-sized, opossum-like things, lived in the days of the dinosaurs, say 100,000,000 years back. But insects were abundant in the coal age, which is three times that far away in time, and they existed even earlier.

Not only that, but the coal age insects were essentially the same as some forms that exist today. Coal age cockroaches and dragonflies, for example, are easily recognizable as such, though some of them were giants. There were cockroaches bigger than mice, and dragonflies with bodies a foot long. Nevertheless, cockroaches and dragonflies they were, and in all the time they have had to evolve into something radically different they are cockroaches and dragonflies still.

To be sure, there are many species of insects new since that long-ago time, but even the most advanced of them, the fly-mosquito and wasp-ant families, practically finished their evolution while the mammals were still fairly boiling over with new life-forms, and long before any creature that could be called even pre-human appeared on the scene. In the amber found in the sands of the Baltic there are embalmed mosquitoes and ants that are identical with species now living. And these embalmed insects can count their ages in millions of years against mere scores of thousands for man and the animals with which man is most familiar.

This conservatism of the insects may have some bearing on the endless warfare between man and the swarming six-legged world that was here so long before him. Several factors determine victory in any war: relative numbers and strengths of the opponents, their persistence against each other, their intelligence and adaptability. In the mankind-insect war, the insects have the advantage of numbers and speed of recruiting, for most insects breed very fast. Insects also have terrific persistence. But that same persistence is in itself an index to the vast psychological chasm that yawns between man and the insect world. Insects do marvellous things by what we call, for lack of a more explicit word, "instinct"; but they can adapt themselves to changed circumstances very little indeed. Confronted by a situation new to his experience, a man or even an ape stops and thinks his way out of it; an insect is baffled, and butts its head against the same windowpane, or gnaws vainly at the same caging iron wire screen until it dies. Victory is not always to the wise; yet the mental conservatism of the insects, apparently as firmly fixed as their bodily conservatism, must surely be a considerable weight in the balance on the side of man.

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In the 28 year fight that has been waged on the gypsy moth in this country, some 50 kinds of wasps, beetles and other possible moth enemies have been tried as attackers.

PSYCHOLOGY

Shoppers Choose Dresses In Average Time of 15 Minutes

SCIENCE has been watching women shoppers buying dresses. After watching 200 women customers trying on dresses or "just looking," Esther K. Thor, home economics student at the University of Wisconsin, has emerged with a string of observation and some practical suggestions.

A joint report by Miss Thor and Dr. May L. Cowles, in the Journal of Home Economics, states that for each dress purchased the average customer tries on five dresses. Fifteen dresses was the largest number tried on.

Miss Thor, who acted as aid to the shop saleswomen during the experiment, found that no less than half the dresses purchased required alteration to make them fit. This alteration problem caused many women to decide not to buy after they tried on a dress.

Other observations made by Miss Thor are:

Half the women with shopping companions consulted them about the dresses. Some women asked advice from the saleswoman or observer. But only three women brought men along on the dress hunt.

Customers showed little interest in learning trade names either for materials or colors.

Judging by comments, over half the customers considered the fit of a dress the most important factor in its suitability.

Prices were uppermost in the shoppers' minds. Seventy-one of the 200 women shoppers definitely declared at the start the price they wished to pay. And all but one of these chose a dress of that price.

Over half the women who bought dresses completed their selection in 15 minutes or less. Only two customers dragged out the job to over an hour.

Miss Thor advocates that customers be more specific in telling saleswomen why they decide against a given dress. This information would help the retailer, and indirectly the manufacturer, to gauge consumer demand and would in the long run lead to more satisfactory products, she declares.

She also advocates that manufacturers and retailers should investigate reasons why dresses do not fit, and should consider more carefully the sizes needed for their clientele.

The dependence that women customers put on the judgment of saleswomen and companions shows that saleswomen, and women customers too, should learn the basic principles of clothing selection and design, the investigator declares.

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• First Glances at New Books

Psychology

PERSONS ONE AND THREE—Shepherd Ivory Franz—*McGraw-Hill*, 188 p., $2. You have only to ask yourself the question, "Where was I on September 29, 1923, at 9.30 a. m.? to realize that you too, have lost many sections of your life. You have no idea where you were or what you were doing, and must, perhaps, search diary or calendar to bring it back. Cases of multiple personality are exaggerated instances of this universal tendency to forget. The man described in Dr. Franz's book lost many sections of his life which despite all efforts still remain unrecovered. He remained person number one until 1914 when he was 27 years old. From 1915 on he was at most times a third person. Person number two has never been recovered. Psychologists will find great interest in this detailed account of a man's experiences in gathering his personalities together. Other readers will be caught up by the drama of the tale.

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Medicine

YOUR LONG SUFFERING STOMACH—Arthur F. Kraetzer—*McBride*, 120 p., $1.50. A small volume of good advice amusingly given. If freak diets don't tempt you, you won't need it but you might like to give it to some relative or friend whose stomach you suspect to be "long suffering." The book is well summed up in Dr. Kraetzer's final advice, "Don't diet; eat food."

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Ethnology—Botany

ETHNOBOTANY OF THE FOREST POTAWATOMI INDIANS—Huron H. Smith *Milwaukee Public Museum*, 154 p., 38 pl., $2.50. The fourth publication of Mr. Smith's series on plants used by the Indian tribes of Wisconsin. Before describing the plants, telling their uses and Indian beliefs regarding them, the author introduces his subject by describing the history and culture of the Potawatomi tribe.

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Forestry

MEASURES FOR STAND IMPROVEMENT IN SOUTHERN APPALACHIAN FORESTS—Staff of the Appalachian Forest Experiment Station—*Gov. Print. Off.*, 57 p. This booklet is issued as Forestry Publication No. 1 of a new series designed especially for use in the present program of emergency conservation work. It tells briefly and understandably what trees are worth saving in each principal forest type and gives instructions how to save them. It shows how to build erosion-checking dams. It gives lists of trees, shrubs and economic insects. Whenever it becomes available for general distribution there is sure to be a big demand for it.

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Zymology

AMERICAN WINES AND HOW TO MAKE THEM—Philip M. Wagner—*Knopf*, 295 + xiv p. $2. Believers in temperance are hoping, now that prohibition is as good as gone, that the American people can be won from a devotion to bad "hard liquor" and be made converts to the quieter pleasures of beer and natural wines. This book tells of the possibilities of American-grown grapes, goes to some extent into the science of wine-making, and gives, incidentally and discursively, many interesting historical side-lights.

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Education

AN EXPERIMENT IN THE USE OF A TEACHING UNIT IN SCIENCE—Archer Willis Hurd—*Institute of School Experimentation, Teachers College, Columbia Univ.*, 50 p., 60c. plus 3c. postage. A report and discussion of an experiment conducted in 28 schools during the school year 1932-33. The teaching unit used in the experiment was electricity in communication.

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Geology

THE GEOLOGY OF NESS AND HODGEMAN COUNTIES, KANSAS—Rycroft G. Moss—*State Geological Survey of Kansas*, 48 p., 20c.

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Standards

A.S.T.M. STANDARDS ON ELECTRICAL INSULATING MATERIALS—*American Society for Testing Materials*, 242 p., $1.25.

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Biology

LIFE IN THE MAKING, THE STORY OF HUMAN PROCREATION—Alan Frank Guttmacher—*VikingPress*, 297 p., $2.75 This book, written with the assistance of Ellery Rand, not only tells the story of human reproduction as it is known to science today but also tells the history of man's ideas and slowly acquired knowledge about his own origin. Old legends and misconceptions appear side by side with scientific facts. The lay reader will find answers to almost any question he may have had about fertility, sterility, sex determination, twins, sexual abnormalities, etc. A number of personal anecdotes make particularly interesting the sections on twins; Dr. Guttmacher himself is an identical twin.

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Astronomy

LEHRBUCH DER ASTRONOMIE—Dr. Elis Strömgren and Dr. Bengt Strömgren—*Verlag von Julius Springer, Berlin*, 555 p., RM 32. In German this volume with 186 illustrations presents a comprehensive summary of present astronomical knowledge. The senior author is the Danish astronomer in charge of the international clearing house for astronomical telegrams and professor in the University of Copenhagen.

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General Science

MUSEUMS OF THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES, 1932 report—William Henry Fox—*Brooklyn Institute of Arts and Sciences*, 69 p., free.

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Physiology

LABORATORY DIRECTIONS IN GENERAL PHYSIOLOGY—E. Newton Harvey and Arthur K. Parpart—*Holt*, 45 p., 60c. Third revised edition.

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Geology

GEOLOGY AND MINERAL DEPOSITS OF SOUTHERN YUMA COUNTY, ARIZONA—Eldred D. Wilson—*Univ. of Arizona*, 236 p., 4 folded maps, free.

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